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Enhanced Thermoelectric Performance of Compacted Bi0.5Sb1.5Te3 Nanoplatelets with Low Thermal Conductivity

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Abstract

We report fabrication of compacted Bi0.5Sb1.5Te3 nanoplatelets using hydrothermal methods followed by cold pressing and sintering in an evacuated ampoule at various temperature of 300–380 °C. The compacted Bi0.5Sb1.5Te3 sintered at 340 °C has the highest power factor of 11.6 μW/cm·K2 and its thermal conductivity is 0.37 W/m·K at 295 K, which is very low as compared to the typical value of 1 W/m·K. The resulting dimensionless figure of merit ZT is 0.93 at 295 K.

Key words：Hydrothermal; Thermal conductivity; Thermoelectric